

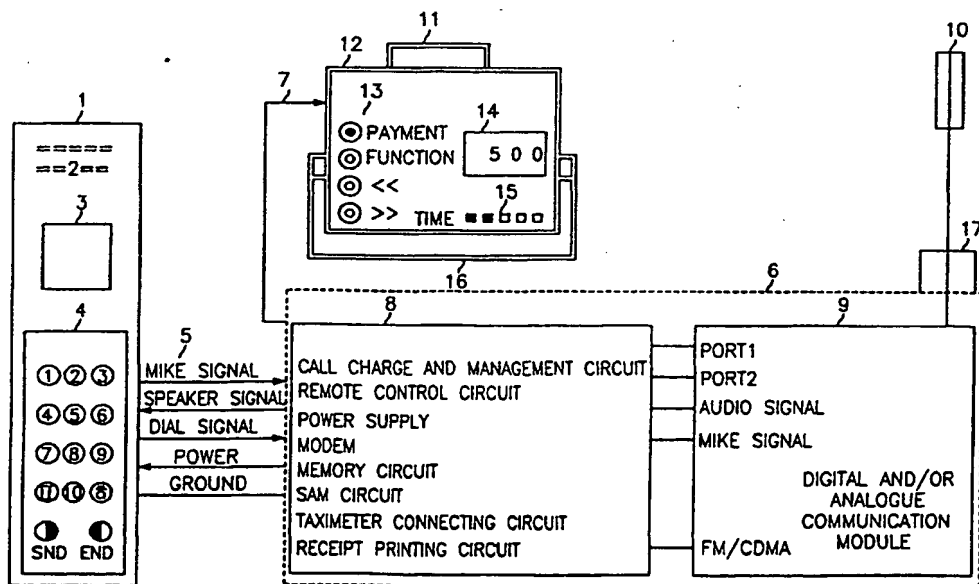


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(54) Title: SYSTEM AND METHOD FOR CHARGING FEE FOR PUBLIC MOBILE TELEPHONE CALL IN MOVING OBJECT



(57) Abstract

Disclosed is a system and method for charging fee for public mobile telephone call in a taxi according to a charge rate. The post-payment for the telephone fee is carried out in cash or smart card. The charge rate is stored in a memory in the analogue mobile communication mode or is received from the communication network in the digital mobile communication mode. A connection unit connects the charging system to the public mobile telephone and the data stored in the memory is transmitted to a bank through the connection unit.

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SYSTEM AND METHOD FOR CHARGING FEE FOR PUBLIC MOBILE
TELEPHONE CALL IN MOVING OBJECT

Specification

5 Technical Field

 This invention relates to a system and method for
charging a fee for a telephone call in which a taxi driver
can easily charge the passenger(user) at the moment of
getting off or immediately after the call, wherein the
10 charging system shows the current fee and accumulated-fee and
contains the management program for operating a public mobile
telephone which is applicable to the vehicle, e.g., a taxi.
Furthermore, this invention relates to a system and method
for charging the fee of telephone call and a taxi fare in
15 cash, by receiving information about the meterage of taxi,
through the payment system using a smart card and a
contactless card.

Background Art

 An increase in the number of vehicles has resulted in a
20 serious congestion in traffic and a delay in appointments,
thereby causing an inconvenience on personal relationships
and business relations. In the case where a prompt phone call
is required while riding in a vehicle, there may be an
inconvenience in making a phone call while in the car because
25 of the absence of a public mobile telephone in the vehicle
intended for business. Therefore, a public mobile telephone
has become necessary.

 Meanwhile, although the supply for mobile phone service
has been increasing in public transportation, such as on
30 buses, trains, etc., a new charging system, different from
the current public mobile telephone system of coins and

cards, should be developed because it is impossible to apply a public mobile telephone to a vehicle intended for business. That is, there are difficulties in applying the prior system of coins and cards to the taxicab due to problems such as collections, jams, the telephone size, the card size, and countermeasures against jams. Also, an establishable location for a card leader machine prevents the magnetic card system from being applied to the taxicab intended for business. Although, as an alternative measurement, a card swiping system, such as a Credit Card Inquiry Machine, has been developed in the U.S., there are some limits in the application to the current environment: for example, a situation in which the taxicab passenger does not possess a Credit card, the charge and waiting time during credit inquiry, the inconvenience for the passenger to directly swipe a card, a situation in which a communication enterpriser has some loss from non-use of the phone, the high cost of the machine, and construction of a communication enterpriser's assent system.

To sum it up, a public mobile telephone has to be equipped with an appropriate charging system on the basis of the following conditions: the size of the public mobile telephone in a taxicab should be small, and it should be convenient for all passengers in the front and rear seats to use the phone. Unfortunately, since the current using coin and card phone systems have some limits in being applied to the taxicab, there is an absolute necessity for a new charging system.

Thus, a calculator for the telephone fee of a car phone use is disclosed in a Korean Utility Model (Reg. No. 088188), and it is an object of the invention to provide more additional functions to this device for common use.

The prior calculator for the telephone fee still has

some unresolved problems: an accumulated telephone fee in the case of no payment of fees after the call, the establishment of an inner calendar memory to manage a monthly payment bill comparing with the fee of the charging system, an equipment with a communication circuit for transmitting the particulars of a telephone call and for settling the card transaction particulars, a back-up memory for storing, at least, one-month's worth of calling particulars, a signal detection circuit for detecting the starting signal and the ending signal for the fee of an analogue and a digital public mobile phone, a remote control circuit and program for remotely controlling the charge rate for the fee of telephone call, and an input PIN (personal identification number) for supporting the use of many drivers.

15 Disclosure of invention

Accordingly, it is an object of the present invention to provide a system and method for charging a fee for a public mobile telephone call in a moving object, i.e. a taxi.

Furthermore, it is another object of the invention to provide a system and method for charging a fee for a public mobile telephone call according to a charge rate.

In addition, it is a further object of the invention to provide a system and method for settling the fee for a telephone call and a taxi fare by an IC card or in cash.

25 In accordance with an aspect of the present invention, there is provided a system for charging a telephone fee for a call of a public mobile telephone in a moving object, said system comprising: a connection means coupling said public mobile telephone to a telephone fee charging means which charges the telephone fee in response to a control signal for changing a charge rate, such that dial signals and information about the telephone fee are transmitted between

said public mobile telephone and said telephone fee charging means, said telephone fee charging means including: a fee paying means for paying the telephone fee charged by said telephone fee charging means using a payment card; a storage
5 means for storing particulars settled by the payment card and information about the telephone call and the telephone fee; a first communication means for providing a communication line between said fee paying means and said telephone fee charging means; a second communication means connected to
10 said connection means for transmitting particulars of a settled telephone fee to a bank-communication network; and a control means for detecting the charge start and end signals, for calculating the telephone fee based on the information stored in said storage means, and for storing the
15 calculated telephone fee in said storage means and charging the calculated telephone fee.

In accordance with another aspect of the present invention, there is provided a method for charging a telephone fee for a call of a public mobile telephone in a
20 moving object, said method comprising the steps of: receiving dial signals; receiving a charge start signal after storing telephone numbers; calculating the telephone fee using a charge rate and communication time; storing information about the telephone call in a memory, indicating the telephone fee,
25 and ending a charge of the telephone fee in response to a communication ending signal; and settling the telephone fee in cash or payment card.

Brief Description of Drawings

Additional objects and advantages of the present
30 invention will be more readily apparent from the following detailed description of the preferred embodiments thereof when taken together with the accompanying drawings, in which:

Fig. 1 is a schematic diagram showing the apparatus for charging call fee of a public mobile telephone call and for settling the telephone fee and a taxi fare according to an embodiment of this invention;

5 Fig. 2 is a detail diagram of Fig 1; and

Fig. 3 is a flow chart showing a method for charging a fee for a public mobile telephone call and for settling the telephone fee and taxi fare according to an embodiment of this invention.

10 Best Mode for Carrying out the Invention

Hereinafter, the present invention will be described in detail referring to the accompanying drawings.

Referring to Fig. 1, a telephone call and taxi fare charging system according to the present invention includes
15 a public mobile telephone body 6, a handset 1, having a liquid crystal display 3, and a charge indication and settlement unit 12.

The charge indication and settlement unit 12, which is supported in the taxi through an upholder, includes a socket
20 11 for inserting a smart card (IC card), and function buttons 13 for inputting the user's requests, such as payment mode, function selection and left and right movement buttons for indicating the payment and the communication discount rate. Also, the charge indication and settlement unit 12 includes
25 a liquid crystal display (LCD) 14 for indicating the call charge and various services, and a time indicator 15 for displaying the available time period per basic charge unit (hereinafter, referred to as a charge rate). The charge indication and settlement unit 12 is coupled to the body 6 of
30 the public mobile telephone through a communication line 7.

The handset 1 which has a speaker 2, a mike, dial buttons 4 and an LCD unit 3 for indicating the telephone

number, is coupled to the body 6 of the public mobile telephone through a communication line 5, and then the speaker, the mike and the dial signals are transferred therebetween. The power supply and ground lines are also
5 connected therebetween.

The body 6 includes a control unit 8 to control the call charge and the management circuit, the remote control circuit, the power supply, the modem circuit, the SAM (Smart-card Authentication Module) circuit, the memory
10 circuit, the connection circuit for receiving the taxi fare from a taximeter, and the printer circuit for issuance of a receipt of the call charge and the taxi fare. Further, the body 6 includes a digital and/or analogue communication module 9 for connecting the public mobile telephone to an
15 external antenna 10 through an antenna socket 17.

The digital and/or analogue communication module 9, which has a wireless connection to a mobile communication base station and then communicates with other service subscribers, is controlled by the control unit 8 through
20 communication ports 1 and 2. Also, the control unit 8 receives the information about the communication state from the digital and/or analogue communication module 9.

The handset 1 can be implemented with a home wireless telephone for the convenience of the user by being equipped
25 with a transmission and receiving circuit and an amplifier in a specific frequency band. Another transmission and receiving circuit and another amplifier must be supplied for the body 6 to communicate with the handset 1. In this case, the taxi driver may use the handset 1 as a new public mobile telephone
30 within a restricted area after parking the taxi, such as home wireless telephone handset well-known to those skill in the art to which the subject matter pertains.

Of course, it is possible to form the body 6 and the

handset in a body, like a cellular phone. On the other hand, in the case where the charge indication and settlement unit 12 is separated from the body 6 with the removal of the communication line 7, uncharged communication fees may be prevented by controlling the public mobile telephone for the user to have only a receiving service without a sending service. However, in the case of a wireless communication, the body 6 and the handset 1 in a body may be used as a cellular phone.

10 Referring now to Fig. 2, the one-chip microprocessor 22, to be programmed, operates in a digital or analogue communication mode in response to a digital or analogue discriminating (CDMA/FM) signal provided from a digital and/or analogue communication module 9 through a connection
15 unit 39. Of course, in the case where only one of the digital and analogue communication modules is employed, the communication fees are charged in a specific mode without this classification.

A call charge signal can be transmitted from the mobile
20 communication base station with a specific code. However, in the analogue communication mode, such specific code for the call charge cannot be transmitted from the base station because of a bad propagation environment. Therefore, in this case, the dial and ring signals detected in a tone decoder 26
25 and a bell detector 32 may be used as a call charge start signal. When each frequency is inputted into the bell detector 32 employing the M982 digital filter of Teltone Co, Ltd, the related pins are in a positive (+) state. Accordingly, by detecting these positive pins, the state of
30 the current communication lines may be discriminated. In other words, it is possible to use the ring signal as the call charge start signal. In the preferred embodiment of the present invention, voice signals, which are detected by ORing

the states of the pins, may be used as the call charge start signal without the telephone ring.

Meanwhile, in various taxis for which are used by many drivers, the matter for settlement of fee among drivers can be resolved by using a computer lock instead of pushing a PIN, or by using a smart card only for driver in which some fees are filled. Also, a relay (not shown in the Figs) between the speaker and the car audio may be helpful to temporarily block the sound in telecommunication without controlling the car audio by drivers.

As shown in Fig. 2, the call charge and taxi fare charging system includes two memories, one of which is a back-up memory 24 for storing particulars such as the term of the conversation, the charge rate, the dial numbers, the communication-off time and smart card transactions, and the other of which is a calendar memory 25 for providing exact dates and time information through which a discount rate is applied to the telephone calls. In the case of the analogue mobile communication mode, a tone decoder/tone dial 26 changes the charge rate and makes a diagnosis of the system. Also, a phonetic synthesizer 28 sounds out the amount of the call charge, an amplifier 29 and a speaker 30 output the synthetic sounds from the phonetic synthesizer 28. A bus converter 27 outputs the call charge to the phonetic synthesizer 28 and a switch 33 receives requests from the user. Also, the system according to the present invention includes a bus converter 31 for reading out the state of the switch 33, a display 37 for indicating the current call charge, dates, time, and monthly total amount of the call charge, photo-diodes 35 for indicating the available time period per charge rate, photo-diodes 36 for indicating the states of the system, and a bus latch 34 for outputting available time period per charge rate and state information

on the system operation to the photo-diodes 35 and 36.

Referring again to Fig. 2, a smart card socket 44 accepts the smart card, a SAM circuit 43 is connected to the smart card socket 44 and has security algorithms to protect the system from unlawful use of a counterfeit smart card, and an RS232C communication unit 42 couples the one-chip microprocessor 22 to an external apparatus (56 and 57) and the SAM circuit 43. On the other hand, if the amount of the particulars of the smart card transactions exceeds the predetermined memory capacity, a modem control circuit 40 and a modem circuit 41 may operate in response to predetermined protocols to transmit those protocols to a bank through the value added network (VAN). A bus separator 23 discriminates address buses and data and a selecting circuit 38, such as 74HC138, selectively distributes address buses and data buses. The one-chip microprocessor 22 calculates the call charge by recognizing the call charge starting signal and the call charge ending signal, stores the calculated result in the memory and then displays the result, thus controlling each element in the system.

At this time, in the case of the analogue communication mode, the system according to the present invention further includes the bell detector 32, which is connected to the bus converter 31, so as to detect the ring signal for determining the time of the call charge start. Because it is possible to provide the short message service (SMS) in the digital communication mode, the charge rate can be changed by this SMS.

To settle the call charge using a contactless card instead of a contact card, such as the smart card, a contactless card decoding circuit may be used instead of the SAM circuit 43. Also, the smart card socket 44 may be replaced with an antenna which is able to provide an electric

field for a contactless card and receive data emitted from it. On the other hand, it would be well-known to those skill in the art that many functions, which are provided by the bus separator 23, the bus converters 27 and 31, the bus latch 34, 5 the selecting circuit 38, and the like, can be implemented within the one-chip microprocessor 22.

The call charge and taxi fare charging system according to the present invention further includes a taxi fare receiving unit 56 to receive from the taximeter information 10 about the taxi fare to settle with the card and a receipt output unit 57 to transmit the information to an external printer to print a receipt of the call charge and the taxi fare.

The handset 18 includes a speaker 19, a mike 21 and a 15 DTMF generator to produce dual tone multifrequency (DTMF) signals according to the pressing of the dial buttons. The speaker 19 and the mike 21 are respectively connected to the audio and mike terminals of a connection circuit 45 in the digital and/or analogue communication module 9 through the 20 connection unit 39. In the analogue communication mode, the DTMF signals are transmitted in two paths to the tone decoder 26 and the digital and/or analogue communication module 9, respectively. That is, the dial numbers are read out from the DTMF signal transmitted to the tone decoder 26 through the 25 one-chip microprocessor 22 in a first path. In a second path, the DTMF signal is transmitted to the digital and/or analogue communication module 9 through the connection unit 39, thereby calling another communication subscriber on the public mobile telephone. As described above, in the digital 30 communication mode, the first path to the tone decoder 26 may be not required. The digital and/or analogue communication module 9, which can operate in digital or analogue modes, has the connection circuit 45 including communication ports, an

audio, a mike and a digital/analogue discriminating signal line. In the digital communication mode, the digital and/or analogue communication module 9 reads out from the mobile communication base station a specific code associated with the charge rate and transmits it to the one-chip microprocessor 22 to detect the call charge starting signal and call charge ending signal.

The signal conversations of the digital and analogue mobile communications and different controls are performed by using the chip sets of a controller 46 and a modulation and demodulation 47, which are embodied with a semiconductor device on demand. Alternatively, in the case of digital mobile communications, a CODEC chip 55 may be employed in converting voice signals and, in the case of digital mobile communications, an analogue matching unit 53 and an audio processor 54 may be employed in converting voice signals. An automatic gain control circuit 48 controls a gain of the signal. Furthermore, a receiving unit 49 and a transmission unit 51, each of which includes an amplification circuit and a frequency converting circuit, are connected to the mobile communication base station through a duplexer 50 and an antenna 52.

The controller 46 is programmed to read a code corresponding to the call charge in the order message inputted into the voice channel of the analogue mobile communication base station. Further, in the digital mobile communication mode, the controller 46 is programmed to read the bell-on/off code and the charge code inputted into the traffic channel of the base station, and to transmit them to the one-chip microprocessor 22 to dial a telephone number.

The communication unit 42 is a parallel communication circuit capable of communicating with a notebook computer and is supplied with an application to print the particulars

related to the user's communication stored in the memory.

Since the basic fees and the date and time information in the charge equipment are very important in the call charging system, the system should be embodied not to be changed by the taxi driver's carelessness and/or unlawful falsification. It is preferred that they only be changed through the communication unit 42 by a communication service provider only when this change is inevitably required. The back-up memory 24 is divided into five storage areas, i.e., a first storage area for storing the charge rate by regions, a second storage area for storing the secret numbers of the users, a third storage area for storing monthly total amount of the call charges by the users, a fourth storage area for storing the particulars of the communications of the users and a fifth storage area for storing the transaction particulars of the used smart card, being controlled by the one-chip microprocessor 22.

The calendar memory 25 managing date and time information by itself may be embodied with a widely used calendar circuit for the indication of the date and time. Also, when the system power is off, the calendar memory 25, such as a BQ3287, may operate on the back-up power supply. Fig 3 is a flow chart of a method for a telephone call charging system and a settlement of the fees of a telephone call and a taxi fare.

Initially the charging system waits for the input of secret numbers or release of the computer lock in the power jam state. The consistence of the signal with a setting PIN turns on the relay, which supplies power to the mobile telephone body and handset, and turns the public telephone communication on (steps 51 and 52).

Once a dial-key is received, the tone coder reads it, stores the phone numbers in a temporary buffer and checks the

condition of the current communication line from reading the ring recorder. At this time, this condition may be classified into 3 parts, bell-ringing, busy signal and a failure of connection with a mobile communication. If there is no ringing signal, another dial signal is to be in standby mode to receive another dial signal. On the other hand, if there is the ringing signal, the call charge starting signal is only detected on the basis of the recognition that the other party's call began at the moment of the bell ringing stopped (step 53).

After turning on the relay of the car audio, the charging system reads a calendar memory, checks discounted hours and the available calling hours and divides by a charge rate. By doing so, the calculated fee is displayed on a seven segment. Furthermore, once a call is completed, the communication is blocked between the telephone body and the handset, and the telephone fee is read out by an the input port. Afterwards, the fee up to that time is displayed, added up in each user's monthly fee and its call particulars are recorded in the back-up memory (steps 54 and 55).

In addition, after the call, an alarm radiating-diode sets off and the mode of the car audio is back. When the telephone fee displayed on an indicator is charged in cash and a pay-out key is input (step 57), the accumulated telephone fee is to be deleted from the indicator and the alarm radiating-diode is to be off(step 58).

In the meantime, in case the signal of a card-insert is input without the input of the pay-out signal (step 57), the information for a telephone fee (step 60) is received, and the fee is settled by an IC card. Afterwards, the settled card particulars are stored in the back-up memory (step 61). However, in case those particulars are over memory (step 62), they are deleted (step 63) from the back-up memory only after

being transmitted to a bank through the modem. On one hand, in the case of the settlement of the fees for telephone call and taxi fare, it is possible to settle the fees using a smart card or a contactless card by receiving the information
5 for the taxi fare as well as the information for telephone fee.

On the other hand, in the case of no bell-ringing, through ORing the condition of each pin of the decoder, a ring signal is to be perceived in communication-line after
10 dialing.

An increase in the number of vehicles has resulted in a serious congestion in traffic and a delay in keeping appointments, wherefore the social requisition for supplying the vehicle intended for business with a communication
15 service becomes more common. As mentioned the above, this invention provides a system for a telephone call charging system and a settlement of the fee of a telephone call and a taxi fare which are equipped on a public mobile phone, whereby the spread of public mobile telephones are to be
20 generalized and a communication service, which makes it possible to make or receive a call to whenever desired, is to be provided. Also, it is possible to equip a small-size vehicle, i.e., taxi, with the charging system which is simpler, less expensive and smaller than any one up to this
25 point in time.

In spite of the spread of mobile public phones, there is not yet an appropriate telephone call charging system in a taxicabs intended for business, and accordingly, the taxicab can become a "shadow zone" in communication. Therefore, since
30 the indicator is set up to immediately display the fee just after the call, it is possible that the passenger could pay the telephone fee in cash, or by a smart card or a contactless card.

The supply of a communication service in public transportation causing a "shadow zone" of communication is essential in the development of a society and for the advancement of an information-oriented society. Especially, the charging system of the present invention is most applicable to taxicabs thanks to the following reasons: the reduction of fees, the easy mending for maintenance and the rare break-down time. Furthermore, the present invention is composed of a charging system, a display circuit, a card safety circuit, a modem transmission circuit, while the prior public mobile telephone system consists of a charging circuit, a mend for maintenance circuit, a management circuit, a cellular transceiver, a cellular connecting device, a cellular modem, a card leader circuit, a card assent circuit, etc. Also, the passenger need not learn special operation instructions for this invention.

Although the preferred embodiments of the invention have been disclosed for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

CLAIMS

1. A system for charging a telephone fee for a call of a public mobile telephone in a moving object, said system comprising:

5 a connection means coupling said public mobile telephone to a telephone fee charging means which charges the telephone fee in response to a control signal for changing a charge rate, such that dial signals and information about the telephone fee are transmitted between said public mobile
10 telephone and said telephone fee charging means,

said telephone fee charging means including:

a fee paying means for paying the telephone fee charged by said telephone fee charging means using a payment card;

15 a storage means for storing particulars settled by the payment card and information about the telephone call and a telephone fee;

a first communication means for providing a communication line between said fee paying means and said
20 telephone fee charging means;

a second communication means connected to said connection means for transmitting particulars of a settled telephone fee to an external communication network; and

25 a control means for detecting a charge start and end signals, for calculating the telephone fee based on the information stored in said storage means, and for storing the calculated telephone fee in said storage means.

2. The system in accordance with claim 1, wherein said public mobile telephone operates in an analogue communication
30 mode, wherein the charge rate is stored in said storage means, and wherein said system further comprises a charge

rate changing means for changing the charge rate.

3. The system in accordance with claim 2, wherein said system further comprises a detecting means for detecting the dial signals and a ring signal to determine a start in
5 calculating the telephone fee in response to said control means.

4. The system in accordance with claim 2, wherein said system further comprises a voice output means for announcing the telephone fee to a user.

10 5. The system in accordance with claim 2, wherein said system further comprises a switching means connected between an output terminal of an audio and an input terminal of a speaker in said moving abject, wherein said switching means selectively cuts off an output of the audio under control of
15 said control means.

6. The system in accordance with any one of claims 2 to 5, wherein said storage means comprises:
a back-up memory for storing information about the telephone call and particulars of a settled telephone fee
20 under control of said control means; and

a calendar memory for storing information about time and date necessary to apply the charge rate to the telephone fee under control of said control means.

7. The system in accordance with claim 2, wherein said
25 storage means comprises a display for indicating state of said system,

said display including:

a first indicator for displaying a current fee for

the telephone call through a bus under control of said control means; a second indicator for displaying data necessary to manage said system under control of said control means; and

- 5 a third indicator for displaying an operation state of said system under control of said control means.

8. The system in accordance with any one of claims 2 to 5, wherein said fee paying means comprises:

a secret circuit for preventing the payment card from
10 being used in unlawful falsification.

a socket for inserting the payment card.

9. The system in accordance with any one of claims 2 to 5, wherein said fee paying means comprises:

a circuit for decoding a contactless card; and
15 an antenna for applying an electric field to the contactless card and receiving data emanated from the contactless card.

10. The system in accordance with any one of claims 2 to 5, wherein said public mobile telephone comprises:

20 a public mobile communication module communicating with a mobile communication base station; and

a handset communicating with said public mobile communication module, wherein said public mobile communication module and said handset respectively includes
25 the same transmitter and receiver for wireless communication.

11. The system in accordance with any one of claims 2 to 5, wherein said public mobile telephone and said telephone-fee- charging means are connected by a wireless connection.

12. The system in accordance with any one of claims 2 to 5, wherein said fee paying means is an IC card.

13. The system in accordance with claim 1, wherein said public mobile telephone operates in a digital communication mode and wherein the charge rate is received from a mobile communication network

14. The system in accordance with claim 13, wherein said system further comprises a voice output means for announcing the telephone fee to a user.

15. The system in accordance with claim 13, wherein said system further comprises a switching means connected between an output terminal of an audio and an input terminal of a speaker in said moving abject, wherein said switching means selectively cuts off an output of the audio under control of said control means.

16. The system in accordance with any one of claims 13 to 15, wherein said storage means comprises:

a back-up memory for storing information about the telephone call and particulars of a settled telephone fee under control of said control means; and

a calendar memory for storing information about time and date necessary to apply the charge rate to the telephone fee under control of said control means.

17. The system in accordance with claim 13, wherein said storage means comprises a display for indicating state of said system,

said display including:

a first indicator for displaying a current fee for

the telephone call through a bus under control of said control means;

a second indicator for displaying data necessary to manage said system under control of said control means; and

5 a third indicator for displaying an operation state of said system under control of said control means.

18. The system in accordance with any one of claims 13 to 15, wherein said fee paying means comprises:

a secret circuit for preventing the payment card from
10 being used in unlawful falsification.

a socket for inserting the payment card.

19. The system in accordance with any one of claims 13 to 15, wherein said fee paying means comprises:

a circuit for decoding a contactless card; and

15 an antenna for applying an electric field to the contactless card and receiving data emanated from the contactless card.

20. The system in accordance with any one of claims 13 to 15, wherein said public mobile telephone comprises:

20 a public mobile communication module communicating with a mobile communication base station; and

a handset communicating with said public mobile communication module, wherein said public mobile communication module and said handset respectively includes
25 the same transmitter and receiver for wireless communication.

21. The system in accordance with any one of claims 13 to 15, wherein said public mobile telephone and said telephone-fee-charging means are connected by a wireless connection.

22. The system in accordance with any one of claims 13 to 15, wherein said fee paying means is an IC card.

23. The system in accordance with claim 2, wherein said moving object is a taxi.

24. The system in accordance with claim 23, wherein said system further comprises a taxi fare receiving means for providing a meterage for said first communication means, such that said system charges the meterage and the telephone fee.

10 25. The system in accordance with claim 24, wherein said public mobile telephone operates in an analogue communication mode, wherein the charge rate is stored in said storage means, and wherein said system further comprises a charge rate changing means for changing the charge rate.

15 26. The system in accordance with claim 24, wherein said system further comprises a detecting means for detecting the dial signals and a ring signal to determine a start in calculating the telephone fee in response to said control means.

20 27. The system in accordance with claim 24, wherein said system further comprises a voice output means for announcing the telephone fee to a user.

28. The system in accordance with claim 24, wherein said system further comprises a switching means connected between an output terminal of an audio and an input terminal of a speaker in said moving object, wherein said switching means selectively cuts off an output of the audio under control of

said control means.

29. The system in accordance with any one of claims 24 to 27, wherein said fee paying means comprises:

a secret circuit for preventing the payment card from
5 being used in unlawful falsification.

a socket for inserting the payment card.

30. The system in accordance with any one of claims 24 to 27, wherein said fee paying means comprises:

a circuit for decoding a contactless card; and
10 an antenna for applying an electric field to the contactless card and receiving data emanated from the contactless card.

31. The system in accordance with any one of claims 24 to 27, wherein said public mobile telephone comprises:

15 a public mobile communication module communicating with a mobile communication base station; and

a handset communicating with said public mobile communication module, wherein said public mobile communication module and said handset respectively includes
20 the same transmitter and receiver for wireless communication.

32. The system in accordance with any one of claims 24 to 27, wherein said public mobile telephone and said telephone-fee- charging means are connected by a wireless connection.

25

33. The system in accordance with claim 13, wherein said moving object is a taxi.

34. The system in accordance with claim 33, wherein said

system further comprises a taxi fare receiving means for providing a meterage for said first communication means, such that said system charges the meterage and the telephone fee.

35. The system in accordance with claim 34, wherein said
5 public mobile telephone operates in a digital communication mode, wherein the charge rate is stored in said storage means, and wherein said system further comprises a charge rate changing means for changing the charge rate.

36. The system in accordance with claim 35, wherein said
10 system further comprises a detecting means for detecting the dial signals and a ring signal to determine a start in calculating the telephone fee in response to said control means.

37. The system in accordance with claim 35, wherein said
15 system further comprises a voice output means for announcing the telephone fee to a user.

38. The system in accordance with claim 35, wherein said
system further comprises a switching means connected between
an output terminal of an audio and an input terminal of a
20 speaker in said moving abject, wherein said switching means selectively cuts off an output of the audio under control of said control means.

39. The system in accordance with any one of claims 35
to 38, wherein said fee paying means comprises:
25 a secret circuit for preventing the payment card from being used in unlawful falsification.
a socket for inserting the payment card.

40. The system in accordance with any one of claims 35 to 38, wherein said fee paying means comprises:

a circuit for decoding a contactless card; and
an antenna for applying an electric field to the
5 contactless card and receiving data emanated from the contactless card.

41. The system in accordance with any one of claims 35 to 38, wherein said public mobile telephone comprises:

a public mobile communication module communicating with
10 a mobile communication base station; and

a handset communicating with said public mobile communication module, wherein said public mobile communication module and said handset respectively includes the same transmitter and receiver for wireless communication.

15 42. The system in accordance with any one of claims 35 to 38, wherein said public mobile telephone and said telephone fee charging means are connected by a wireless connection.

20 43. The system in accordance with claim 31, wherein said public mobile telephone operates in digital communication mode, wherein the charge rate is stored in said storage means, and wherein said system further comprises a charge rate changing means for changing the charge rate.

25 44. A method for charging a telephone fee for a call of a public mobile telephone in a moving object, said method comprising the steps of:

receiving dial signals;
receiving a charge start signal after storing telephone numbers;

calculating the telephone fee using a charge rate and communication time;

storing information about the telephone call in a memory, indicating the telephone fee, and ending a charge of
5 the telephone fee in response to a communication ending signal; and

settling the telephone fee in cash or payment card.

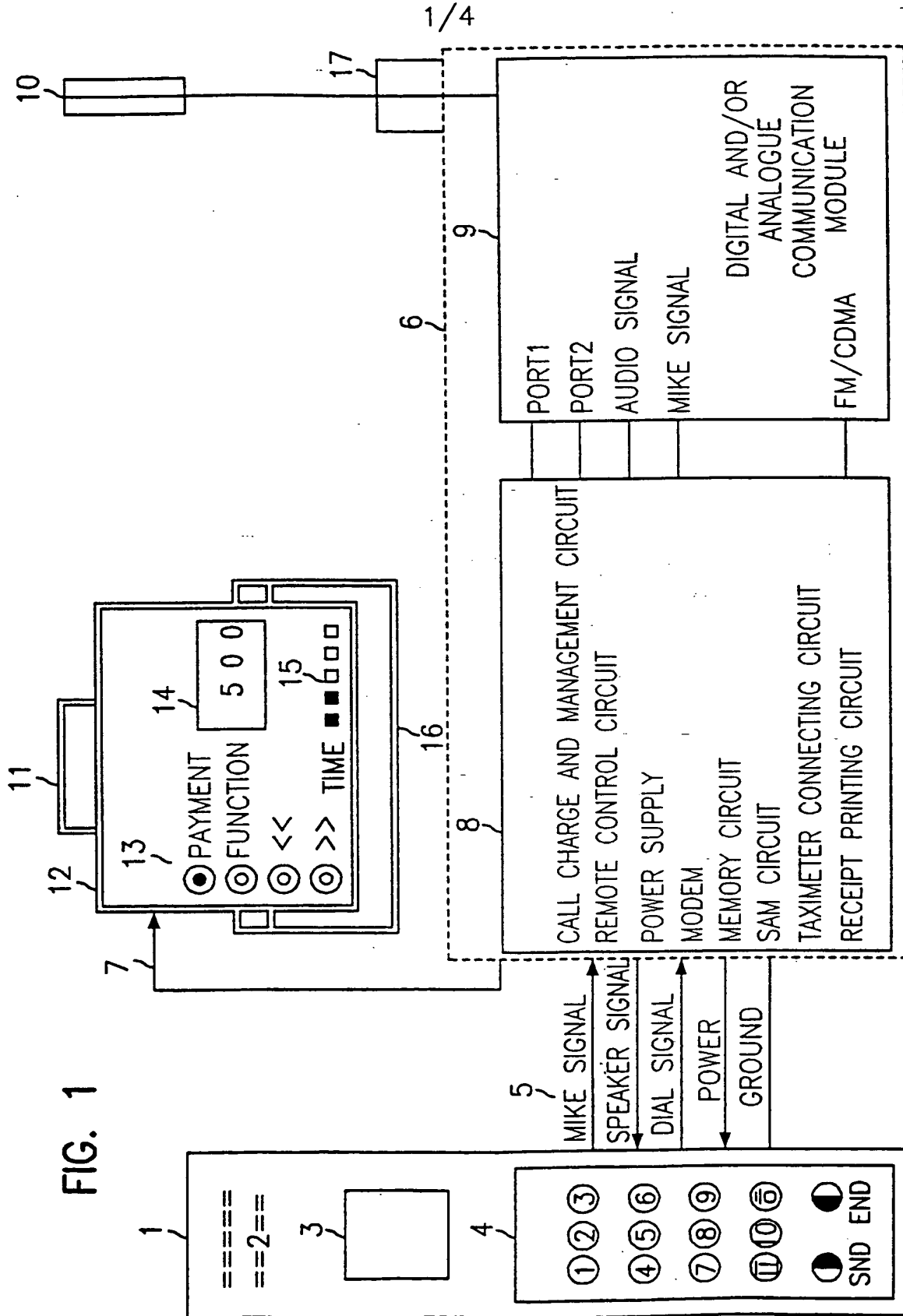
45. The method in accordance with claim 44, wherein said charge rate is provided from a mobile communication network.

10 46. The method in accordance with claim 44, wherein said charge rate is stored in a memory.

47. The method in accordance with claim 44, wherein said method further comprises the step of changing the charge rate.

15

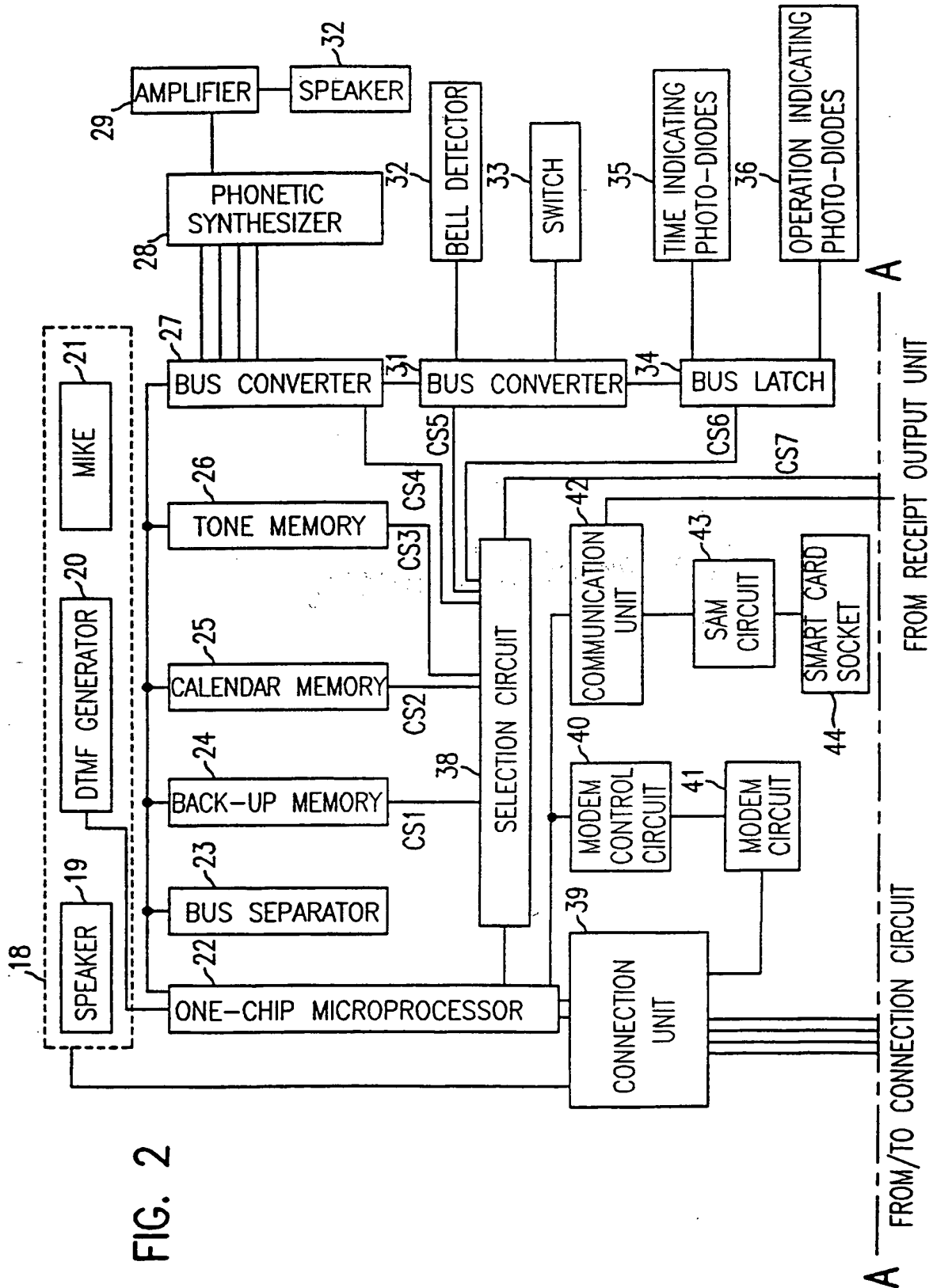
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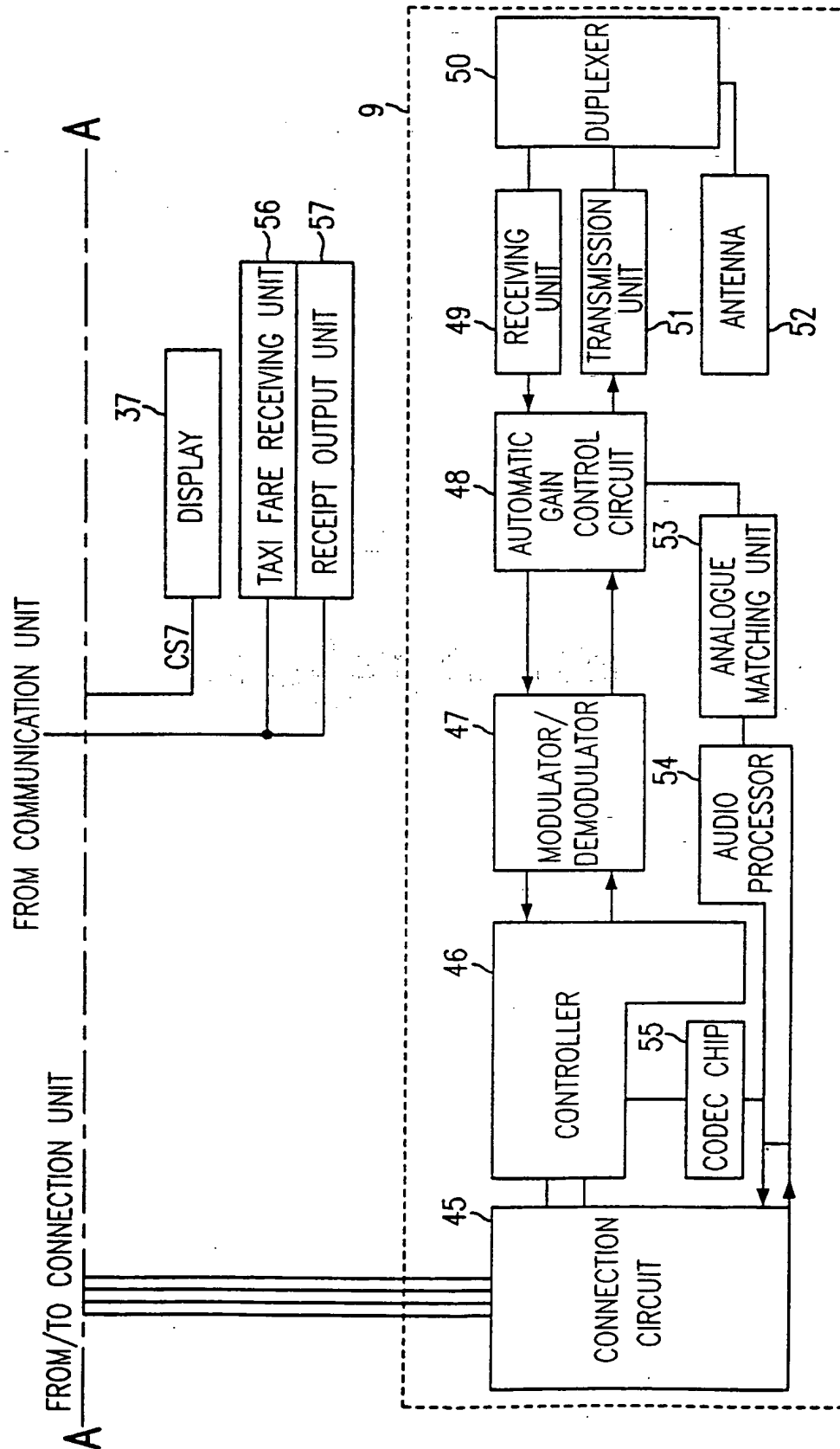
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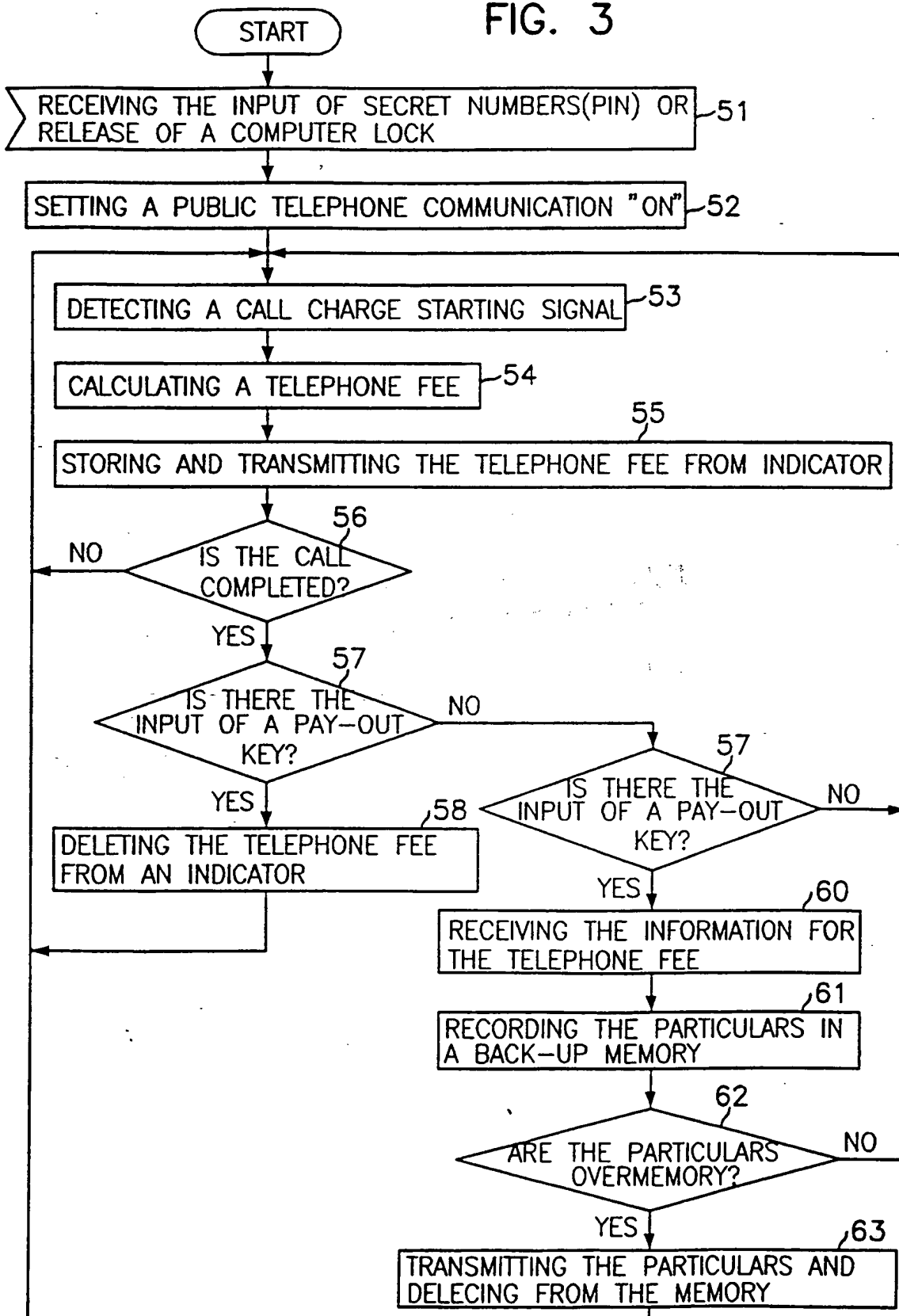
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FIG. 3



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INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR 97/00117

A. CLASSIFICATION OF SUBJECT MATTER

IPC⁶: H 04 M 11/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC⁶: H 04 M 1/00, 11/00; H 04 Q 7/20

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPIL

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 272 747 A (MEADS) 21 December 1993 (21.12.93), abstract; fig.1,2; claims 1,13..	1,44
A	WO 91/18 467 A1 (CELLULAR TECHNICAL SERVICES CO.) 28 November 1991 (28.11.91); abstract; fig.1-4; claims 1,2.	1,44
A	US 5 361 297 A (ORTIZ et al.) 01 November 1994 (01.11.94), abstract; column 4, lines 57-62; fig.6; claim 1.	1,44

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

17 September 1997 (17.09.97)

Date of mailing of the international search report

02 October 1997 (02.10.97)

Name and mailing address of the ISA/ AT

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/KR 97/00117

In Recherchenbericht angeführtes Patentdokument Patent document cited in search report Document de brevet cité dans le rapport de recherche		Datum der Veröffentlichung Publication date Date de publication	Mitglied(er) der Patentfamilie Patent family member(s) Membre(s) de la famille de brevets		Datum der Veröffentlichung Publication date Date de publication	
US A	5272747	21-12-93	AU	A1	42265789	02-04-90
			AU	B2	62241802	04-06-90
			BR	A	89076349	14-05-91
			CA	A1	13176338	11-05-93
			CO	A	10422638	30-03-90
			CN	B	10265939	07-12-94
			EP	A1	4333244	26-06-91
			EP	A4	4333244	27-12-91
			FI	AF	2015455	16-08-90
			FI	A0	9111122	06-03-92
			JP	T2	45000591	30-01-92
			NO	A0	9108993	07-03-91
			NO	A	9108993	07-03-91
			NZ	A	2306009	25-09-92
			WO	A1	9003077	22-03-90
WO A1	9118467	28-11-91	AU	A1	67169790	10-12-91
			AU	A1	79972791	10-12-91
			CA	AA	2083513	23-11-91
			WO	A1	9118466	28-11-91
US A	5361297	01-11-94	US	A	5301220	05-04-94
			AU	A1	19133792	17-11-92
			BR	A	9205910	10-01-93
			CA	AA	21065581	19-10-93
			EP	A1	5800769	02-02-94
			EP	A4	5800769	15-01-97
			FI	A0	9344577	15-10-93
			FI	A	9344577	15-10-93
			JP	T2	65007528	25-08-99
			NO	A0	9344577	18-10-93
			NO	A	9344577	18-10-93
			US	A	5144651	20-04-93
			US	A	5144651	20-04-93
			WO	A1	9219066	29-10-92